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FORMULATION OF WOUND HEALING CREAM CONTAINING ACHYRANTHES ASPERA ROOT EXTRACT

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ABSTRACT

Now a days Herbal medicines are widespread used to treat many disease condition due to their safety and effectiveness. Although almost all its parts are used in traditional medicinal system, seeds, roots and shoots are the main parts used for medicinal purposes. *Achyranthes aspera* is an important medicinal herb which is found as a weed throughout the India. *A. aspera* is known as chirchita in Hindi, apamarga in Sanskrit, aghada in Marathi and prickly chaff flower in English. This plant has been used by people from different states of India to treat cuts. Many phytochemical components have been isolated from plant which shows different activities such as antimicrobial & anti fungal, antiviral, anti fertility, anti-cancerous, anti diabetic, immunostimulant property, wound healing, anti oxidant and anti inflammatory etc.

KEYWORDS: *Achyranthes aspera*, Wound healing, Wound healing cream, Evaluation.

INTRODUCTION

A wound is a physical injury that break or tears the skin. Proper wound healing is required to restore the disturbed anatomical continuity and functional status of the skin. Wound healing means healing of the skin. It is the repair process that follows injury to the skin and other soft tissues. It is essentially a connective tissue reaction. Repair of the damaged tissue occurs through a series of events which occurs in four phases that is hemostasis, inflammation, proliferation, and remodeling.

The Herbal preparations and herbal products are considered as essential and most important sources of modern medicine around the world. Many plants have been shown to have important healing properties. Herbal medicines are also used to treat various skin disorder, which also includes wound healing.

Achyranthes aspera belonging to the family Amaranthaceae is found as a weed throughout the India and in other countries such as Africa, Australia, America and Asia. It grows as a wasteland herb everywhere. *A. aspera* is known as chirchita in Hindi, apamarga in Sanskrit, aghada in Marathi and prickly chaff flower in English. There are various medicinal benefits of *Achyranthes aspera* it is commonly used for asthmatic coughs, snakebites, phobias, urinary stones, rabies, influenza, hemorrhoids, bronchitis, diarrhea, renal edema, gonorrhea, and abdominal pain.

Fig. 1: Achyranthes aspera.

Botanical classification

- **Kingdom:** Plantae
- **Subkingdom:** Tracheobionta
- **Super Division:** Spermatophyta
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Subclass:** Caryophyllidae
- **Order:** Caryophyllales
- **Family:** Amaranthaceae
- **Genus:** Achyranthes
- **Species:** Aspera

MATERIALS AND METHODS

The present research article deals with the formulation and evaluation of woundhealing cream containing *Achyranthes aspera* root extract.

Plant material

The dried root of *Achyranthes aspera* were collected from the field surrounding Aurangabad, Maharashtra (MH). It was authenticated at Botany department of SSIPR College, Aurangabad. Plant root were washed thoroughly with distilled water anddried properly in the shed. The dried root of *A. aspera* were finely grind using an electrical grinder and stored in air-tight containers for further use.

Fig. 2: *Achyranthes aspera* root.

Preparation of extract

The air-dried in-shade plant root bark of Achyranthes aspera was made into coarse powder (40 gm) and, were extracted by using maceration method. The powdered root were macerated in 400 ml of methanol for 3 days at room temperature. The extract was filtered through a filter paper (Whatman filter paper No.1). Again the residue was further extracted using the same procedure. Then filtrates obtained were combined and evaporated to dryness by distillation process.

Selection of materials

1) Stearic acid

Stearic acid is also known as Octadecanoic Acid. It is a saturated long chain of 18- carbon chain, it is described as a waxy and yellow-white substance. Stearic acid helps to improve the texture and consistency of products. It also improves the ability of them to mix with water.

Fig. 3: Stearic acid.

Benefits of stearic acid: Natural cleanser and stabilizer, Effective moisturizing agent, Enhances Overall Texture of Skincare Products, Protects the Skin, Contains skin- healing properties, Suites all skin types.

2) Cetyl alcohol

Cetyl alcohol is also known as 1-hexadecanol. It is a fatty alcohol which is derived from natural sources, such as coconut oil or palm oil. It is white in colour, waxy solid with a mild and non-irritating odour.

Uses of Cetyl alcohol: Texture Enhancement, Stability, Emulsification, Enhanced Delivery, Protection from Environmental Stressors.

Fig. 4: Cetyl alcohol.

3) Liquid paraffin

Liquid paraffin is additionally known as paraffinum liquidum, paraffin oil or russian mineral oil. Liquid paraffin a very highly refined mineral oil used in cosmetics and medicine.

Uses: Liquid Paraffin is an emollient (Substance that softens or relieves the skin). It prevents from water loss from the outer layer of skin. This soothes dryness and leave the skin soft and

hydrated.

4) Glycerine

Glycerin is a naturally occurring compound which is found in your body. However, the glycerin which is found in skincare comes from plant sources such as soybeans and cane sugar.

Uses: Glycerin Keeps Skin Hydrated, Promotes Anti-Aging, Helps Skin Heal, Strengthens Skin's Natural Barrier, Calms inflammation, Wards Off Bacteria.

5) Triethanolamine

Triethanolamine used in the formulation to neutralize the pH.

6) Methyl paraben

Parabens are a family of related chemicals which are mostly used as preservatives. Preservatives are used in the formulation to avoid the growth of harmful microbes and mold. Their primary function is to extend the shelf life of the products by maintaining their quality and safety.

Formulation of cream

The formulation and composition of the cream were shown in Table given below

Table no. 1: Formulation and composition of cream.

Components	Amount (g) For 20g cream	Amount (g) For 50g cream
Active ingredient *A.aspera* root extract	1%	5%
Oily phase		
Stearic acid	2.2	5.4
Cetyl alcohol	0.8	2.0
Liquid paraffin	0.8	2.0
Aqueous phase		
Water	14.7	36.85
Glycerine	1.0	2.5
Triethanolamine	0.3	0.75
Methyl paraben	0.2	0.5

Formulation of wound healing cream

Thoroughly clean the necessary glassware, wash it two times with fresh distilled water and dry it. Weigh the active ingredient and excipients accurately. Prepare the oily phase in one beaker by adding stearic acid, cetyl alcohol, and liquid paraffin with accurate weight. In

another beaker, prepare the aqueous phase by adding water, glycerine, and triethanolamine. Keep both the beakers on a water bath for melting at 60-70degree celcius. Now, add the oil phase into the aqueous phase dropwise with continuous stirring. Add the active ingredient and mix it properly. Finally, add the preservative methylparaben after cooling. Formulation is then stored in an airtight container.

Evaluation test

1. **Organoleptic evaluation:** It refers to the evaluation of wound healing cream by its colour, odor, state, texture.

2. **Wash ability:** This test is carried out by simply washing applied cream with water.[6]

3. **Determination of type of smear:** It was determined by applying the cream on the surface of the skin of human volunteers. After application of the cream, the type of film or smear formed on theskin were checked.[6]

4. **pH determination:** Approximately 1g of the cream was weighed and was dissolved in 10 ml of distilledwater and its pH was measured.

5. **Determination of spreadability:** Sample was applied between two glass slides and was compressed to uniform thickness by setting 100gm weight for 5 minutes. Weight was added to the pan. Thetime required for the seperation of the two slides, i.e. the time in which the upper glass slide moved over the lower slide was taken as measure of spreadability.[6]

It was calculated using the formula: $S= m* L / T$[6]

Where,

S – Spreadability

m- Weight tied to upper glass slideL- Length moved on glass slide

T- Time taken The determinations were carried out in triplicate and the averages of three readings were recorded.[6]

6. **Accelerated stability testing**

Creams were divided into three parts and stability tests were performed by storing them at different temperature conditions including room temperature.

7. **Irritancy test**

Mark an area (one sq. cm) on the left-hand dorsal surface. The cream was applied to the

specified area and time was noted.[6] Irritancy, erythema, oedema was checked if any for regular intervals up to 24 hours and reported.[6]

RESULT AND DISCUSSION

The evaluation parameters for wound healing cream were performed and there results are as follows.

1. Organoleptic evaluation

The wound healing cream was evaluated and the results are listed below in Table no.2. The colour of the formulation was found to be creamish white, with odourless odour. the texture and smoothness was desirable according to the formulation.

Table no. 2

Sr. no.	Properties	Observations
1.	Color	Creamish white
2.	Odor	Odorless
3.	State	Semisolid
4.	Texture	Smooth
5.	Appearance	Good

2. Physicochemical parameters

Physicochemical Evaluation of wound healing cream were evaluated for physicochemical parameters which is listed in Table no. 3. the pH of the wound healing cream was found close to neutral. The cream was found to be non irritant andstable at room temperature.

Table no. 3

Evaluation Parameter	Value	Observation
1.pH	7	neutral
2.Irritancy	-	Non irritant
3.Stability	-	Stable at roomtemperature

3. Physical evaluation

The wound healing cream was evaluated regarding the physical property parameterswhich is shown in Table no. 4

Table no. 4

Sr. No.	Evaluation parameter	Observation

1.	Wash Ability	Washable
2.	Type of Smear	Non-Greasy
3.	Grittiness	No Grittiness
4.	Homogeneity	Homogeneous
5.	Consistency	Semisolid & soft
6.	Spreadability	Excellent

CONCLUSION

Our study successfully formulated and evaluated a wound healing cream incorporating achyranthes aspera root extract. According to the finding the formulation was stable at room temperature and it can be applied to the skin without risk. Throughout the trial period the formulated cream showed good spreadability, good wash ability and no signs of phase seperation was observed.

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